



US006332495B1

(12) **United States Patent**
Jamison et al.

(10) **Patent No.:** **US 6,332,495 B1**
(45) **Date of Patent:** **Dec. 25, 2001**

(54) **CLIP ON MANIFOLD HEAT EXCHANGER**

(75) **Inventors:** **S. Donald Jamison, Waterloo; Carl C. J. Decalre, Cambridge; Jeffrey D. Peeler, York; Chad A. Kreutzweiser, Kitchener, all of (CA)**

(73) **Assignee:** **Long Manufacturing Ltd., Oakville (CA)**

(*) **Notice:** Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 0 days.

2,182,338 *	12/1939	Gurlik	165/152
3,016,230	1/1962	Cederstrom et al. .	
3,265,126	8/1966	Donaldson	165/140
3,472,316	10/1969	Couch, Jr.	165/153
3,757,855	9/1973	Kun et al.	165/166
4,313,494 *	2/1982	Bengtsson	165/148
5,062,476	11/1991	Ryan et al.	165/173
5,186,250 *	2/1993	Ouchi et al.	165/177
5,236,042	8/1993	Kado	165/149
5,501,271	3/1996	Wijkstrom	165/173
5,667,004	9/1997	Kroetsch	165/41
6,012,512 *	1/2000	Ghiani	165/140
6,068,050 *	5/2000	Ghiani	165/174

(21) **Appl. No.:** **09/685,818**

(22) **Filed:** **Oct. 10, 2000**

Related U.S. Application Data

(63) Continuation-in-part of application No. 09/411,295, filed on Oct. 4, 1999.

(30) **Foreign Application Priority Data**

Jun. 2, 1999 (CA) 2273456

(51) **Int. Cl.⁷** **F28F 9/04**

(52) **U.S. Cl.** **165/153; 165/148; 165/149; 165/67; 165/173; 165/174**

(58) **Field of Search** **165/148, 153, 165/149, 173, 174, 175; 29/890.052**

(56) **References Cited**

U.S. PATENT DOCUMENTS

1,420,917 * 6/1922 Elliott 165/148

* cited by examiner

Primary Examiner—Allen Flanigan

(74) *Attorney, Agent, or Firm*—Ridout & Maybee LLP

(57) **ABSTRACT**

A plate and fin type heat exchanger is disclosed which can be made in any convenient size with minimum tooling required. The heat exchanger is made from a plurality of stacked plate pairs having raised peripheral edge portions to define flow channels inside the plate pairs. The plates of the plate pairs are formed with offset, diverging end flanges that space the plate pairs apart. A U-shaped channel envelops the plate end flanges to form part of a manifold at each end of the plate pairs. End caps or plates close the open ends of the U-shaped channels to complete the manifolds, and inlet and outlet openings are formed in the manifolds as desired to complete the heat exchanger.

22 Claims, 9 Drawing Sheets

